

Borehole

41-11-10Log Event **A****Borehole Information**

Farm : <u>SX</u>	Tank : <u>SX-111</u>	Site Number : <u>299-W23-64</u>
N-Coord : <u>35,287</u>	W-Coord : <u>75,810</u>	TOC Elevation : <u>663.96</u>
Water Level, ft :	Date Drilled : <u>3/7/1956</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.313</u>	ID, in. : <u>8</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>125</u>	

Equipment Information

Logging System : <u>2</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>03/1995</u>	Calibration Reference : <u>GJPO-HAN-1</u>	

Logging Information

Log Run Number : <u>1</u>	Log Run Date : <u>6/23/1995</u>	Logging Engineer: <u>Bob Spatz</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>29.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>6/26/1995</u>	Logging Engineer: <u>Bob Spatz</u>
Start Depth, ft.: <u>124.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>71.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>3</u>	Log Run Date : <u>6/26/1995</u>	Logging Engineer: <u>Bob Spatz</u>
Start Depth, ft.: <u>28.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>65.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

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Analysis Information

Analyst : D.C. StromswoldData Processing Reference : Data Analysis Manual Ver. 1Analysis Date : 11/15/1995**Analysis Notes :**

Borehole 41-11-10 was logged in three runs in a move-stop-acquire mode that collected spectra for 100 seconds every 0.5 ft. Repeatability in the overlap section was within the statistical uncertainty limits of the measurements. Gain drifts during the first and third runs made it necessary to process the data in two segments with different energy calibrations.

Verification spectra showed that the tool was operating correctly. The verification spectrum obtained after the first run had slightly poorer energy resolution than normal, but its count rates were consistent with other runs.

Correction factors for 0.33-in.-thick-steel casing were used during data processing.

Cs-137 was the only man-made radionuclide identified in this borehole. It occurred in sufficiently great concentrations at locations along the borehole to saturate the counting system. The main location of Cs-137 is in the interval from 61 to 89.5 ft, where concentrations were about 600 pCi/g near 79 ft. No data were obtained in the interval from 65 to 70.5 ft because of high dead times in the data collection system. Spectra in the interval from 82.5 to 83.5 ft were distorted because of high count rates, making accurate calculation of the Cs-137 concentration impossible. The small, apparent concentration of contamination at the bottom of the hole (124 ft) could be related to contaminants that settled to the bottom of the casing or the change in geometry caused by the end of the casing.

The K, U, and Th logs indicate a possible lithology changes near depths 83 and 110 ft, where the K value increases. The extended gap from 77 to 85 ft in the U log is due to the high Cs-137 concentration in this interval, which obscures the 609-keV gamma-ray peak used to calculate U.

For additional log data interpretation, see the discussion for this borehole included in the Tank Summary Data Report for SX-111.

Log Plot Notes:

Three log plots are provided. The first one shows Cs-137 concentrations. The second one shows the naturally occurring radionuclides (K-40, U-238, and Th-232), which can be used for lithology interpretations. A combination plot includes logs of Cs-137, natural gamma, total gamma derived from the spectral data, and the latest available data from WHC Tank Farms gross gamma logging. The headings of the Cs-137 and natural gamma plots identify the specific gamma rays used to calculate the concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the minimum detectable activity (MDA). The MDA of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible. If the reported concentration is slightly above the MDA, the 95-percent confidence interval may extend below the MDA value and detection is not assured with 95-percent certainty.

The Tank Farms gross gamma plot is the latest available from WHC. No attempt has been made to adjust the

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plot for depth discrepancies, which are obvious when comparing the gross gamma log with the total gamma log. The two logs also have somewhat different shapes, noticeable in the gross gamma's lack of the double peak present in the total gamma log near 80 ft.